MINUTES
CONSTRUCTION BOARD OF ADJUSTMENTS AND APPEALS
January 12, 2012
2:00 PM

1. CALL TO ORDER

The Chairman, Marc Wiener, called the meeting to order at 2:00 pm in the Vista Center 1st Floor Conference Room 1W-47, Palm Beach County Planning, Zoning & Building Department, 2300 North Jog Road, West Palm Beach, Florida.

A. ROLL CALL

MEMBERS PRESENT
Marc Wiener, Chair
Ron Dixon, Vice Chair
Duane Drawdy
Peter Dzenutis
Albert Godfrey
Bart Rasper
Margie Walden

MEMBERS ABSENT
Michael Walker

OTHERS PRESENT
Rebecca D. Caldwell, Building Official
Dawn Wynn, Asst. County Attorney
Ashley Salvati, Recording Secretary
Ken Nida, PBC Chief Mechanical Inspector
Michael Fox, Codes, Products & Training Supervisor
Richard Gathright, Deputy Building Official
Peggy Costa, Notary
Michael Manno, Manco Air, Inc.
Craig Brockwell, Manco Air, Inc.
Dr. Amir Abtahi, Mechanical Engineering Professor, Florida Atlantic University

B. Approval of Minutes. Motion was made to approve the minutes of November 10, 2011. Motion was seconded and passed unanimously.

2. ADDITIONS & DELETIONS – NONE

3. NEW BUSINESS

A. Case # 12-02 Manco Air, Inc. – Florida Building Code: Building & Mechanical

- Ms. Peggy Costa swore in all those giving testimony.
- Ms. Rebecca Caldwell stated that appellant would like to overturn the Building Official's decision to not allow further permitting on the product until the required testing criteria is provided, as is described in the attached sections of the Florida Building Code regarding alternate materials and methods.
- Mr. Richard Gathright stated that he first became involved with the solar air conditioning systems in Fall 2010, and upon reviewing the product, he wanted to try to approve the new product for permitting, at which point he came to Ms. Caldwell to discuss the possibility of a provisional permit. The initial permits were issued based on a statement made by an engineer indicating that the units complied with the certification portion of the code. In Mid-March, Mr. Gathright and Ms. Caldwell met with Mr. Manno to discuss what conditions were necessary in order to issue the initial permits. At this meeting, Mr. Manno showed a two to three hour snapshot of an efficiency rating of the unit. After analysis, it was determined that further testing showing a longer period of time was necessary for permitting.
- Mr. Ken Nida stated that he first became involved with the systems in September 2010, when he attended a meeting with the permit applicant, an engineer, Michael Fox, and some other staff members. At the meeting, approvals and documentation of the systems were requested.
- Ms. Caldwell asked Mr. Nida to discuss his e-mail correspondence with Mr. Jim Hammond, regarding claims that 31 jurisdictions have previously permitted the systems.
- Mr. Nida said that Mr. Hammond provided him with a list of counties that had permitted the system. Mr. Nida then tried to contact those jurisdictions for input. Those who responded said that either they did not permit the system, or had never seen the system.
- Ms. Caldwell asked Mr. Nida about the contents of the letter from the Florida Solar Energy Center.
- Mr. Nida said the FSEC letter stated that in their opinion the design was not viable, and could actually result in a system running at decreased efficiency.

- Ms. Caldwell asked how he felt about the conditional issuance of the permits.
- Mr. Nida said that he felt we did not have enough information at that point.
- Ms. Caldwell asked about the field data submitted by Manco Air.
- Mr. Nida said yes, they submitted engineering data on a psychometric chart, but the field data did not provide adequate information regarding some key variables in the home. He discussed his concerns in his presentation to the Palm Beach County Building Code Advisory Board.
- Chairman Wiener asked for a brief synopsis of how the system is supposed to perform.
- Ms. Caldwell referred the Board to the graphs in the meeting package.
- Mr. Nida continued with some of his concerns: the calculations did not add up to the indicated SEER rating, the system operates as a 2-speed system and the calculations were only done on the lower speed, there was no baseline study of the house and it was only a study of a snapshot of the day, on an ideal day with weather in the 70s.
- Ms. Caldwell asked about the calculations of the amperage used and watt calculations.
- Mr. Nida said that they used the high speed CFMs with the low speed test; if they used the 1140, the resulting EER should have been 23.4
- Mr. Fox stated that he first became involved with solar AC systems in September 2010, with Mr. Nida. The determination of the meeting was that if they wanted to obtain permits in the future they would need to provide engineered plans, third party testing, and the manufacturers' written approval to field modify their certified equipment and system. He stated that all conversations with companies and contractors regarding this type of system resulted in the same determination.
- Ms. Caldwell asked about the characteristics of the design that were beyond the scope of normal code recognized certifications.
- Mr. Fox responded that the proposed system involves a field modification to the ACU (Air Condensing Unit) that voids the equipment's certification, listing and labeling. The field modification involves cutting the Freon line inside the ACU assembly and routing it to a roof mounted solar collector and then back down to the Condensing coil in the ACU. Neither the ACU manufacturer nor the solar collector manufacturer was willing to approve the use of their products in this manner. In addition, the greatly increased length of tubing on the High pressure side of the A/C system will disrupt the overall balance of the system and could negatively affect the efficiency and longevity of the equipment.
- Ms. Caldwell asked if Mr. Fox assisted with Mr. Nida's presentation to the Building Code Advisory Board.
- Mr. Fox said that he did assist with the presentation and the direction of the Board was to obtain more information by drafting a letter to AHRI and the associated manufacturers to see if there would be an approval of such a field modification.
- Ms. Caldwell also asked if the Florida Solar Energy Center was written to and if responses were received.
- Mr. Fox said that they were written to as well, and the responses included: the manufacturer Nordyne, stating that they would not approve the system; the Florida Solar Energy Center, stating simply that the system would not work; and, AHRI's director of certification programs, stating that the systems falsely claimed AHRI certification; he also sent us a copy of the "Cease-and-Desist" letter that AHRI sent to Sedna Air, regarding their false claims of AHRI certification.
- Ms. Caldwell asked if the Building Code Advisory Board took any further action.
- Mr. Fox stated that the Building Code Advisory Board drafted a technical advisory as a "Public Awareness Notice" to advise Palm Beach County's citizens of the concerns with this design.
- Ms. Caldwell stated to the Board that many of the contractors and distributors of this system have been interrelated, and that they found out in March that Manco Air was no longer associated with Sedna Air. She also stated that there had not been any additional contact during the past few weeks, pending this matter going before the Board.
- Mr. Godfrey asked Ms. Caldwell if it is correct that she has authority to review these systems for Code compliance, but does not necessarily have to approve them.
- Ms. Caldwell said this is correct.
- Mr. Wiener asked if there has been feedback from the homeowners who had them previously installed.
- Ms. Caldwell said that upon looking at inspection histories of permits for these systems, many had not been completed, and some had gone inactive.
- Mr. Wiener asked what the results were in terms of efficiency.
- Ms. Caldwell responded that we were not aware of any legitimate efficiency studies being performed.

- Mr. Drawdy asked about the schematic in Mr. Nida's powerpoint presentation.
- Ms. Caldwell said that it was provided by a distributor of the system. She also noted that it was confusing how the solar collector could 'save energy' when it was interjected into the system downstream from the compressor, which would continue to operate as normal and draw a large amount of electrical power.
- Mr. Drawdy asked how it is supposed to work.
- Ms. Caldwell said that the distributors allege that the solar panel has the capacity to superheat the refrigerant after it leaves the compressor and prior to entering the condensing coils. She continued that the Building Division determined they have serious doubts about the ability to superheat a refrigerant that is already at 300 PSIG and 195°F. Other concerns include that at night an opposite cooling effect could occur as the refrigerant flows through the collector on the roof.
- Ms. Walden asked if the County had sent any other formal correspondence besides the letter from Barbara Alterman.
- Ms. Caldwell said no, however, contact had been made in permit critiques, verbal communication, and e-mails.
- Mr. Wiener said if there are no further questions, he would like to hear from the applicant.
- Mr. Brockwell, of Manco Air, stated that they are not associated with Sedna Air and never were. He continued that the first permit they applied for was on November 29, and questioned who Mike Fox met with on September 10 because it was not from their company and they have nothing to do with Jim Hammond who is mentioned in the paperwork. He said that this technology has been around since 1968, and referred to a piece from a mechanical book discussing an evacuated tube collector being the best form to superheat refrigerant.
- Mr. Brockwell continued that they have over 45 jobs between here and Broward that have all passed final inspections. They have submitted applications for permits for air conditioners with AHRI certificates. In order to a permit on a solar panel in the state of Florida, it needs to be SRCC-certified and FSEC-approved. He stated that Mr. Hammond's panel was neither.
- Mr. Brockwell continued with his explanation of how the system works, stating that the heat recovery unit uses water to cool down the refrigerant in the thermodynamic process to assist the condenser and compressor in cooling that refrigerant down. The greater the distance between the outside ambient air temperatures and refrigerant, the quicker the refrigerant can condense to a liquid, and the more liquid refrigerant you have coming through the thermal expansion valve inside the evaporator, turning the liquid to gas, the quicker the house reaches the desired temperature.
- Mr. Brockwell continued that a regular R22 does not work because it only has one speed – high speed. However, the multiple-stage compressor from Emerson, in addition to a solar collector with proper thermal capabilities causes high pressures and high temperature refrigerant. Because there is no third-party testing for these solar panels, certification from a Florida registered engineer that the two components will not detract from the efficiency rating of the air conditioner. He said that they have a certified letter from Jack Mitchell, an engineer who works with them on this project and also sits on the Broward County Board of Appeals *(this claim was never verified)*.
- Mr. Brockwell also stated that the permits referred to in the exhibits were not their permits and asked who they belonged to.
- Ms. Caldwell responded that the Building Division has issued six permits to Manco and 2 permits to Andy Anders.
- Mr. Brockwell said they only have 5 permits and wanted to clarify that Andy Anders and Sedna Air are separate contractors from Manco Air, and that the information presented to the Board was not relative to Manco Air.
- Mr. Wiener asked if Manco Air was asked to provide back-up information.
- Mr. Brockwell said no, and asked Mr. Nida about the chart referenced.
- Mr. Caldwell responded that any questions should be addressed to her, as the Building Official. She continued that Mr. Fox received something on his desk, which was supposed to be from Manco Air. We were under the impression until March 15, that your companies were all connected. We have an e-mail from Richard Ackner on March 14, who you claim to never have met, stating, "Florida Solar AC is no longer an installer for Sedna Air."
- Mr. Brockwell responded that they had met with David Kaufman, who was an installer of this system, and that upon investigating the proposed system, Manco determined that the system would not get permitted

because it did not have certification.

- Ms. Caldwell said that the certification for the solar collector in his system is based on use with water.
- Mr. Brockwell disagreed, stating that Ms. Caldwell misinterpreted it. SRCC certification test is for the thermodynamic properties, and that they use water as a testing media, and Mr. Brockwell claimed that any liquid or refrigerant can be put through it. Additionally, he said that all portions are tested separate, not as a unit.
- Mr. Godfrey said that the Building Division wants to know that the system ultimately works, and asked if any approved testing has been performed on the system.
- Mr. Brockwell asked where in the Florida Building Code it states that there is a requirement for testing for two separate approved products. He said that as required, they received a letter from an engineer stating the system does not detract from efficiency and that the company does its own testing. We have affidavits from customers who are saving $150-$300 a month and permitted jobs that have been installed over a year that work.
- Mr. Brockwell continued that after receiving 5 permits, they applied for three more, which were denied because the Building Division asked for further testing.
- Mr. Rasper asked if the panel is designed to have water go through it.
- Mr. Brockwell responded anything, not just water.
- Mr. Rasper asked how it is connected.
- Mr. Brockwell responded silver-soldered.
- Mr. Rasper said that he disagrees, and that this collector is designed for use with water.
- Mr. Brockwell said no, because glycol and air put through it, and that the SRCC certificate addresses this.
- Ms. Caldwell responded that the Building Division had contacted the manufacturer of the TP-24 Solar Collector, and that they had said that there has not been any testing for refrigerants, only water.
- Mr. Brockwell insisted they only use water as test media, and that there are many permitted systems using glycol. He read from a booklet of Gear Solar, the manufacturer of the panel, that the panel is "appropriate for domestic hot water, solar radiant flooring, space heating, and solar cooling".
- Mr. Brockwell continued that he believes that the Building Division may be mistaking his solar panel with another, and that he is the sole distributor of this panel in the state of Florida.
- Mr. Wiener asked what model number panel they are using.
- Mr. Brockwell said the TP24.
- Ms. Caldwell pointed out that two contradictory statements had been made: (1) that it was better to add heat immediately after the compressor, and (2) that it was better to let the refrigerant cool immediately after the compressor. Which is it? She also read from Gear Solar, "Solar panel TP24 is a high performing evacuation tube collector that is manufactured to be used for domestic hot water, space heating, absorption chilling and other hot water uses. It has a maximum strength of 116 PSI." She pointed out that any other use could exceed the tested capacity of the collector.
- Ms. Caldwell also continued, regardless of who the FL Solar Energy Center's letter was addressed to, that it clearly stated that FSEC does not certify panels for such uses as proposed here.
- Mr. Brockwell said they do not have the means to certify panels because it would be endorsing the product; instead, they choose to show the thermal properties. Therefore since these results are not available, the Florida Building Code states that if two different components are used, a licensed engineer can certify that it will not detract from the efficiency.
- Mr. Drawdy asked if the 40 other permits that Mr. Brockwell referred to earlier have been submitted to Palm Beach County.
- Mr. Brockwell said no because the County thought they were another company.
- Mr. Drawdy also asked if the letter from the engineer approving the panel design has been submitted to the County.
- Mr. Brockwell said yes, we have a signed and seal letter saying the two components working together will not detract from but only increase the performance of the system.
- Mr. Drawdy asked the County if they require anything else for the issuance of permits.
- Ms. Caldwell said they issued the initial permits conditionally based on the letter from the engineer. She continues that the letter states it "can be said that it can increase the performance", not necessarily WILL. She said that she and Mr. Gathright spoke with Mr. Manno and requested submittal of field evaluation data because the system was not being installed per the manufacturer's specifications. We still have not

received any field evaluation data.

- Mr. Fox noted that the Building Code Advisory Board's Technical Advisory, which is one of the attached exhibits, was generic to a technical design, not specific to any system or person.
- Mr. Gathright stated that he met with Mr. Manno at the beginning of this process, and has known who he was dealing with all along. He also stated that, at some point, Sedna Air tried to intervene on behalf of Mr. Manno in order to get permits.
- Mr. Brockwell insisted that Sedna Air was doing this unbeknownst to Manco Air, and that our records must have mixed up the two companies.
- Mr. Brockwell also said that Manco Air's first permit was submitted November 29, 2010, and because the county said it was earlier, they must be referring to another company's permit.
- Ms. Caldwell displayed a permit from Manco Air from November 10, 2010.
- Mr. Brockwell read from his engineer letter: "We see nothing in referenced system and/or circumstances that would use more energy or reduce the SEER since it already exceeds the minimum SEER."
- Ms. Walden commented to Mr. Brockwell, that building departments are in place to protect the public, and that when the staff requests back-up information for new technology that the data should be produced. Data from homeowners who have had the system installed would also be useful to verify that the public welfare is truly being protected.
- Mr. Brockwell said he understands that and they do have their own data, such as outside ambient air temperature, the temperature of refrigerant, and other information that has been collected from customers; however, he was unaware that he needed all of this information.
- Mr. Dixon responded that he should have brought whatever supporting information he had gathered, as he knew he was appearing before the Board.
- Mr. Brockwell said that he did not have enough time to prepare.
- Ms. Caldwell said that because the appeal was submitted only a day before the deadline, it was difficult for the County to prepare, as well. She restated that the initial permits were issued conditionally so that additional data could be collected in order to substantiate the issuance of further permits. The Building Department did this because they felt empathy as there were no established standards of testing for this type of system. She cited Section 105 as the code that allows her, as the Building Official, to determine what is considered appropriate testing.
- Mr. Gathright said that Barbara Alterman's letter was a direct response to Mr. Brockwell's September 15th e-mail to Ms. Alterman. Significant research was done prior to the response on September 23rd. According to the letter, we had requested back-up data to "demonstrate the technical feasibility of your product pilot project demonstrations, laboratory testing, scientific modeling, or engineering".
- Mr. Dixon asked if we upheld the Building Department's decision to not permit these systems due to lack of adequate testing and verification, would the applicant or others like them be able to apply for a permit with adequate data.
- Ms. Caldwell said yes, permits would be issued upon the submittal of evidence that verifies the system works.

Mr. Dixon made a motion to uphold the decision by the Building Department, while allowing the applicant to apply again in the future with proper data. The motion was seconded and passed.

- Dr. Amir Abtahi stood to make a comment from the public. He is a professor in the Mechanical Engineering Department at Florida Atlantic University (FAU), teaching thermal dynamics and solar energy for nearly 30 years. He is also a registered engineer and certified solar contractor. He learned of Manco Air's systems six to seven months ago when a Boca Raton resident approached FAU with a system that was not functioning properly. After inspecting the system, he was baffled and contacted several other professors to discuss because he could not find how it scientifically made sense. He spoke with contacts at the Florida Solar Energy Center and they told him they filed it under "snake oil sales". He also said that the panels are rated at approximately 115 PSI; however, he measured 500 PSI going through the panels on the day he was there. He was so concerned that they would burst that he advised the consumer to cover the panels and get away from them.
- Dr. Abtahi continued that the claim by Manco on SEER rating is also false, because you can not do SEER rating because you are under laboratory conditions. Ratings must be done under ARI conditions, not just a short period of time. He also said that they would withstand hurricane pressure, which is why Florida Solar Energy Center is hesitant to approve them in coastal communities.

4. OLD BUSINESS – NONE

5. BOARD MEMBER COMMENTS

6. STAFF MEMBER COMMENTS – NONE

7. ADJOURNMENT

The Chairman, Marc Wiener, adjourned the meeting at 3:51 p.m.

Marc Wiener, Chair

Respectfully submitted,
Ashley Salvati
Recording Secretary